

tubercle; toes not webbed. A fold of the skin runs from the superciliary margin along the middle of the side towards the inguinal region, separating the pink coloration of the back from the dull yellowish of the lower parts. Upper parts subsymmetrically marbled with light brown; two or three pairs of whitish dots edged with black on the back, the most constant being that corresponding to the extremities of the sacral apophyses. The front pair are minute, between the eyes; others, very minute, are scattered in the coccygeal region. Sides of the head blackish. Young specimens nearly uniform pink above.

	millim.
Length of body	35
„ fore limb	22
„ first finger	$2\frac{1}{2}$
„ second finger	3
„ third finger	5
„ fourth finger	$3\frac{1}{3}$
„ hind limb	48
„ metatarsus	$7\frac{1}{2}$
„ third toe, measured from metatarsus..	10
„ fourth toe, ditto	14
„ fifth toe, ditto	9

Two specimens from Anzahamaru; one from Mahanoro.

M. Grandidier has most kindly allowed me to examine the specimens of *Callula* (and other reptiles) recently named by him; he himself has expressed his doubts as to the propriety of referring these frogs to the Indian genus *Callula*, in which I fully agree with him. They are undoubtedly adult specimens of his highly interesting genus *Dyscophus* (a *Discoglossoid*). Singularly enough the discovery of *Callula notosticta* reestablishes the fact that *Callula*, or at least a form most closely allied to it, really occurs in Madagascar.

XXXII.—*New and peculiar Mollusca of the Eulimidæ and other Families of Gastropoda, as well as of the Pteropoda, procured in the 'Valorous' Expedition.* By J. GWYN JEFFREYS, LL.D., F.R.S.

Eulimidæ.

Eulima stenostoma, Jeffr.

Eulima stenostoma, Jeffr. in Ann. & Mag. Nat. Hist. 3rd ser. ii. p. 128, pl. v. f. 7.

Station 6, 410 fms. Shetland, 75-90 fms. (J. G. J.). Nor-

way, 50–400 fms. (Lovén and others). ‘Porcupine’ Expedition, 1869, 64–114 fms.: 1870, English Channel, 358–690 fms.; Mediterranean, 1456 fms. Ægean, 310 fms. (Spratt)! Palermo, 210 mètres=nearly 114 fms. (Monterosato). Gulf of St. Lawrence, 166 fms. (Whiteaves)!

Naticidæ.

Natica affinis, Gmelin.

Nerita affinis, Gm. Linn. Syst. Nat. ed. 13, p. 3675.

BODY yellowish-white, with fine streaks of purple at the upper sides of the foot: *mantle* thick, folded over the umbilicus or basal cavity of the shell: *tentacles* conical and pointed, turned back on the front edges of the shell at its mouth: *eyes*, none observable: *foot* large, roundish-oval.

Variety *occlusa*.

Natica occlusa, S. V. Wood, Mon. Crag Moll. (1848) p. 146, tab. xii. f. 4a, b; Suppl. (1872) p. 76, t. iv. f. 11.

BODY pale yellowish, with a purplish tinge or slight streaks of the latter colour on the back of the foot: *head* large, hood-shaped, indented in the middle: *mantle* thick, spread over the back of the shell: *tentacles* conical and finely pointed, wide apart, and separated by a rather thin veil: *eyes*, none perceptible: *foot* enormous and very voluminous, broad and cloven in front, expanding greatly on each side, and rounded behind.

Variety *vittata*.

BODY milk-white: *head* forming a broad and bilobed snout: *tentacles* conical, pressed by the head-flaps against the front of the shell, and for the most part concealed; tips pointed: *eyes* not to be detected: *foot* large, thick and broad, folded inwards at the sides, rounded in front, and bluntly pointed behind. Sluggish. Floats with its foot uppermost.

Godhavn, 5–20 fms.; Station 4, 20 fms. (var. *vittata*: *globosa*, *spira extensa*, *vittis duabus purpureis distantibus ultimo, una cum penultimo, anfractum cingentibus*); 5, 57 fms. (var. *occlusa*); Holsteinborg, 12 fms. (var. *vittata*) and 35 fms.; Station 7, 1100 fms. (fragment); 13, 690 fms. (operculum). Arctic seas, in both hemispheres, and Norway, 20–450 fms. ‘Porcupine’ Expedition, 1869, 74–345 fms. (var. *lactea*: *minor*, *ovata*, *alba*, *spira extensa*): 1870, coast of Portugal, 994 fms.; Mediterranean, Adventure Bank, 92 fms. (young). One of the most common and characteristic fossils of the newer Tertiary and Quaternary formations in the north of

Europe and America, and indicative of glacial conditions; it has a vertical range of 1840 feet.

This species varies considerably in the comparative height of the spire and in the angularity or compression of the whorls below the suture. The variety *occlusa* attains a large size, one of my specimens measuring $1\frac{3}{10}$ inch in length, and $1\frac{1}{10}$ in breadth; another specimen, from Spitzbergen, is nearly as large. *N. russa* of Gould is apparently a variety also of *N. affinis*. The synonyms are:—*N. clausa*, Broderip and Sowerby; *N. consolidata*, Couthouy; *N. septentrionalis* (Beck), Möller; and *N. janthostoma*, Deshayes. I have taken the descriptions of the animals from my note-book; they somewhat differ.

A very young shell of another species of *Natica* occurred in Station 9, 1750 fms. It resembles the fry of *N. grænlandica*, but has one whorl less, the last is more expanded, and the apex is flattened. Should an adult specimen be found, it might be named *sphæroides*.

Solariidæ.

*Sequenzia formosa**, Jeffr.

Sequenzia formosa, Proc. Roy. Soc. vol. xxv. no. 173, pp. 200, 201 (woodcuts).

SHELL globosely conical, rather thin, semitransparent, nacreous and glossy: *sculpture*, sharp keel-like spiral ribs or ridges, of which there are two on the middle of the body-whorl (besides ten thread-like riblets on the base) and one on the middle of each of the other whorls; there is also a slighter rib immediately below the suture; between the ribs the surface is covered with numerous and delicate curved striæ, which turn alternately in different directions, so as to give a flexuous character to this part of the sculpture; the striæ between the infrasutural and peripheral rib turn to the left, while those between the peripheral and the next rib (or in the upper whorls between the rib in the middle and the base) turn to the right; the same alternate order is to a great extent observable as to the direction of the striæ on the base of the last whorl; these striæ are crossed by fine close-set spiral lines, producing a reticulated appearance; all the whorls are similarly sculptured except the top whorl or apex, which is smooth: *colour* pearly-white: *suture* marked by the uppermost rib: *spire* turreted: *whorls* 7, somewhat convex, gradually enlarging; the last takes up three fifths of the shell; apex globular:

* Beautiful.

mouth large, indented by the spiral ribs: *outer lip* thin, prominent, and deeply scalloped: *inner lip* thick, folded back on the *pillar*, which is short and incurved; at the bottom of the pillar is a small but sharp tooth-like projection, below which is a short and abrupt notch, like that of *Cerithium*: the *groove* or slit on the upper part of the last whorl, and opening from the mouth (which characterizes the genus), is wide and deep, terminating in a curved indentation: *base* somewhat concave, but imperforate or without any umbilicus: *operculum* none. L. 0·2. B. 0·15.

Station 12, 1450 fms.; 16, 1785 fms. (fragment). 'Porcupine' Expedition, 1870, off the coasts of Portugal, 718-795 fms. 'Challenger' Expedition, Station 56, S.W. of Bermudas, 1075 fms.! Gulf of Mexico, 325 fms. (Pourtales)! Fossil in the Pliocene formation at Trapani in Sicily as *S. monocingulata* (Seguenza, MS.).

The peculiar and exquisite sculpture is not unlike that of *Adeorbis subcarinatus*. My only specimen which contained the animal was in vain sacrificed at the altar of science in the hope of detecting an operculum.

Seguenzia carinata *, Jeffr.

Seguenzia carinata, Proc. Roy. Soc. vol. xxv. no. 173, p. 201.

SHELL forming a depressed cone, thin, transparent, glossy, but not nacreous: *sculpture*, a sharp keel round the periphery, a thread-like spiral rib below the suture of each whorl (varying in position), numerous but slight flexuous striæ below the rib, and in some specimens minute close-set curved longitudinal striæ on the upper whorls; the base is smooth, or marked only with microscopic lines of growth: *colour* glassy: *suture* rather deep: *spire* short: *whorls* 7, compressed, slightly shouldered by the infrasutural rib; the last whorl is proportionally large, and the first is globular: *mouth* narrow, rhomboidal, angulated in the middle by the keel, and below by the base of the pillar: *outer lip* thin: *inner lip* filmy, spread on the base: *pillar* very short and incurved; it is furnished near the bottom with a small tooth-like process, below which is a short notch: *groove* broad, apparently not deep; it occupies the middle of the body-whorl between the suture and the peripheral keel: *umbilicus* narrow but deep, exposing all the whorls, encircled and defined by a slight rib. L. 0·125. B. 0·175.

Station 13, 690 fms. 'Porcupine' Expedition, 1870, Bay

* Provided with a keel.

of Biscay, 718–1095 fms. 'Challenger' Expedition, west of Fayal, Azores, 1000 fms.

Velutinidæ.

Pilidium radiatum, Sars.

Capulus radiatus, Sars, Beretning om en i Sommeren 1849 foretagen zoologisk Reise i Lofoten og Finmarken, p. 64 (1850).

BODY milk-white: *mantle* very thick, covering one third of the mouth of the shell: *tentacles* club-shaped, slender, compressed or flattened, contractile, closely striated across at the tips, and thickly covered with short cilia: *eyes* placed on small bulbs near the outer base of the tentacles: *foot* oblong, proportionally small, rounded and double-edged in front, and bluntly pointed behind. Very sluggish, and exudes a large quantity of stringy slime. Adhering to a dead shell.

Station 5, 57 fms. (a single specimen); Holsteinborg, 12 fms. (a young shell). Spitzbergen (Torell)! Finmark (M. Sars)! Sea of Okhotsk (Middendorff)! Japan (A. Adams). Aleutian or Fox Islands, N. Pacific (Dall)! Fossil: Uddevalla and Kuröd, Sweden (Hisinger, J. G. J.); Moray Firth (Robert Dawson)! Montreal (Principal Dawson).

Synonyms: *Pilidium commodum*, Middendorff, 1851; *Piliscus commodus* and *Piliscus probus*, Lovén, 1859; *Capulus dilatatus* and *C. depressus*, A. Adams, 1860 and 1864.

Through the kindness of Professor G. O. Sars and of Dr. L. von Schrenck I have lately been able to compare with my specimens from Davis Strait the typical specimens of *Capulus radiatus* and *Pilidium commodum* from the Christiania and St. Petersburg Museums. All of them exactly agree with each other, as well as with my fossil specimens of *Piliscus probus* (Lovén) from Uddevalla. Sars's Norwegian shell and mine from 57 fathoms in Davis Strait are marked with coloured streaks, which radiate from the apex or crown, while the others are not streaked or coloured.

The generic name *Pilidium* was published by Middendorff in his 'Malacozootologia Rossica,' 1849. Professor Forbes gave the same name for *Tectura fulva* in the Report of the British Association for 1849, published in 1850; and *Pilidium* was described in 1853 by Forbes and Hanley as their generic name for the last-mentioned shell. The late Professor Sars substituted, in 1858, the generic name *Capulacmæa* for his *Capulus radiatus*. Professor Lovén, in 1859, proposed *Piliscus*. Possibly *Capulus fallax* of Mr. S. V. Wood (a Crag fossil) may be another species of *Pilidium*.

Cancellariidæ.

Cancellaria viridula, Fabricius.

Tritonium viridulum, Fabr. Fn. Gr. p. 402.

BODY milk-white: *head* furnished with a long and prominent veil: *tentacles* contractile, thread-shaped, rather long and slender, smooth, with blunt tips, diverging at an angle of 45° : *eyes* placed on the top of short stalks, at the outer base of the tentacles, with which the eye-stalks are united: *foot* large, triangular, and long, squarish and double-edged in front, and bluntly pointed behind; edges uneven: *pallial fold* (lining the basal groove of the shell) very short and thick. No operculum. Active; crawls out of the water. It emits a greenish liquid on being touched with a camel's-hair brush—a habit that reminds one of *Planorbis corneus*, which gives out a purple liquid when irritated.

Holsteinborg, 30 fms.; Station 13, 690 fms. (fragment). Spitzbergen, 5–15 fms. (Krøyer, Torell, Eaton). White Sea (Middendorff). Iceland, 80 fms. (Mörch). Norway, 20–300 fms. (Sars and others)! 'Lightning' Expedition, 500–550 fms. 'Porcupine' Expedition, 1869, north of the Hebrides, 114–345 fms.: 1870, Channel slope, 305–567 fms. Labrador, 40–50 fms. (Packard). Gulf of St. Lawrence, 30–40 fms. (Whiteaves)! N.E. coasts of the United States, 20–150 fms. Behring Strait (Wosnessenski). N. Japan, 48 fms. (St. John)! Fossil: Red and Coralline Crag, and Bridlington; Christiania (Crosskey and Robertson)!; Labrador (Packard).

I cannot perceive any difference between *Cancellaria* and Möller's genus *Admete*, except in the former having stronger folds or plaits on the pillar; these were not noticed by Fabricius in his description of the present species. The apex in *C. cancellata*, however, is peculiarly sculptured, and somewhat resembles that of *Columbella haliæti*.

Synonyms: *Murex costellifer*, J. Sowerby; *Admete crispa*, Möller; *Cancellaria buccinoides*, Couthouy; *C. Couthouyi*, Jay, Gould.

Cerithiidæ.

*Cerithium procerum**, Jeffr.

SHELL pyramidal, solid, opaque, and glossy; base slightly concave: *sculpture*, curved longitudinal ribs, of which there are about 30 on the last and 20 on the next whorl; the three

* Long.

uppermost whorls are nearly smooth; the base is irregularly marked with flexuous striæ, these being an extension of the ribs; the periphery of the last whorl is encircled by a spiral ridge, which is continued on all the other whorls, and defines the suture; under a microscope may be detected also traces of numerous slight spiral lines between the ribs: *colour* pale yellowish-white: *spire* tapering; apex twisted obliquely, and extended: *whorls* 13-14, somewhat convex; the last occupies about a third of the shell: *suture* distinct, but not deep: *mouth* narrow and rhombic, with a wide groove at the bottom, where it forms an imperfect canal, which bends abruptly to the left: *outer lip* incurved and thin: *inner lip* filmy: *pillar* short and flexuous, with a sharp edge. L. 0.4. B. 0.1.

Station 12, 1450 fms.; a dead specimen. 'Lightning' Expedition, between the north of Scotland and the Faroes; a fresh and living specimen, but the operculum is not visible.

Buccinidæ.

Buccinum grænlandicum, Chemnitz.

Buccinum grænlandicum, Chemn. Conch. Cab. x. (1788) pp. 177, 182, tab. 152. f. 1448.

BODY lemon-colour, more or less closely speckled and mottled with purplish-brown: *head* short; intertentacular veil indented in the middle: *tentacles* sharply pointed: *eyes* black, seated on offsets or short tubercles, one at the outer base of each tentacle: *foot* extensile, squarish in front, and bluntly angular behind: *siphonal tube* long, cylindrical, and narrow: *opercular lobe* round, with projecting edges. Active.

Godhavn, 5-20 fms.; Station 4, 20 fms.; 5, 57 fms.; Holsteinborg, 12 fms. Davis Strait (Fabricius and others). Melville Bay, 140 fms.; and Port Kennedy, 15 fms. (Walker). Port Foulke, in Smith Channel or Sound (Hayes, *vide* Stimpson). Gulf of St. Lawrence, 5-250 fms. (Principal Dawson, Whiteaves)! Coasts of N.E. America (Gould and others)! Newfoundland (P. P. Carpenter)! N. Pacific (Middendorff and others). Spitzbergen (Torell)! Iceland (Mörch). Norway (G. O. Sars and others)! Russian Lapland (Middendorff). Fossil in our Red Crag and newer Tertiaries = *B. tenerum*, J. Sowerby.

Extremely variable in shape, size, texture, sculpture, and colour. I regard the following as synonyms, or as representing some of the varieties:—*B. undatum* of Fabricius (not of Linné), *B. undulatum* of Möller, *B. cyaneum* of Beck, *B. Donovanii* of Gould (not of Gray, which is *B. glaciale* of Linné), *B. tenebrosum* and *B. sericatum* of A. Hancock; apparently

B. fusiforme of Kiener, from a specimen in the Massena Collection. Another variety of the present species in Möller's collection at Copenhagen is named "*Tritonium Humphreysianum*." It is also probably the *B. boreale* of Gray (in the 'Zoology of Capt. Beechey's Voyage'), which he refers to a species said to be so named by Leach in the Appendix to Sir John Ross's first voyage; but I can find no such name in that Appendix. *B. grænlandicum* of Hancock is a variety of *B. glaciale*.

The spawn-capsules are smaller than those of *B. undatum*, and are sometimes attached to the stalks of seaweeds and to the shells of *Balani*.

B. undatum is apparently rare in the arctic seas, although it is occasionally found with *B. grænlandicum*.

Buccinum ciliatum, Fabricius.

Tritonium ciliatum, Fabr. Fn. Gr. p. 401.

Godhavn, 5-20 fms.; Holsteinborg, 10-35 fms. Greenland (Fabricius and others). Murray Bay, Gulf of St. Lawrence, 112 fms. (Principal Dawson, Whiteaves)! Spitzbergen (Torell)! White Sea and the coasts of Russian Lapland (Von Baer, Middendorff); it is the latter's variety *boreale* of *B. tenebrosum* of Hancock.

It is the *B. Mölleri* of Reeve, whose *B. ciliatum* is *B. grænlandicum*. The *B. ciliatum* of Gould is apparently a variety of the last-named species.

Buccinum tenue, Gray.

Buccinum tenue, Gray in Zoology of Beechey's Voyage, p. 128, t. 36. f. 19.

BODY white with a yellowish tinge, and irregularly speckled with purplish-brown: *head* broad; intertentacular veil straight or having an even edge: *tentacles* conical, bluntly pointed: *eyes* round, black, placed on small oblong bulbs at the outer base of the tentacles: *foot* large and thick, rounded and double-edged in front, acute-angled behind: *siphon* or pallial tube cylindrical, rather strong and stout, slit along its whole length: *penis* folded and compressed, speckled above like the rest of the body. Rather sluggish, but not shy.

Godhavn, 5-80 fms.; Waigat Strait, 15-25 fms.; Station 1, 175 fms.; 3, 100 fms.; 5, 57 fms.; Holsteinborg, 10-35 fms. Greenland (Möller and others). Gulf of St. Lawrence, 50-60 fms. (Whiteaves). Newfoundland (Totten, *fide* Stimpson)! Spitzbergen (Torell, Eaton)!

B. scalariforme (Beck), Möller; *B. tortuosum*, Reeve; perhaps

also *B. boreale* of Broderip and Sowerby, from Kamtschatka. My largest specimen is more than $2\frac{1}{2}$ inches long.

Muricidæ.

Trophon clathratus, Linné.

Murex clathratus, Linn. Syst. Nat. ed. 12, p. 1223.

BODY pale yellowish-white: *tentacles* slender, but rather short: *eyes* small, placed at the top of stalks which are nearly as long as the tentacles and are united with them: *foot* large, squarish and double-edged in front, with angular corners, rounded or bluntly pointed behind: *siphon* consisting of a short and tubular fold. Shy.

Godhavn, 5–20 fms.; Waigat Strait, 15–25 fms.; Station 4, 20 fms.; 5, 57 fms.; Holsteinborg, 12–35 fms. ‘Porcupine’ Expedition, 1869, off the Hebrides, 165–580 fms. North Polar seas, Spitzbergen, Iceland, Norway, White Sea, N.E. and N.W. coasts of America, at depths of from 20 to 120 fms. North Japan, 3–48 fms. (v. Schrenck, St. John).

Var. *truncata*. Godhavn, shore; St. 4, 20 fms.; 5, 57 fms.; Holsteinborg, 12–35 fms. ‘Lightning’ Expedition, 189 and 530 fms. ‘Porcupine’ Expedition, 1869, 85 fms. British and Scandinavian coasts, and Iceland. *Buccinum (truncatum)*, Ström.

The typical species and variety are common fossils in our newer Crag and in all the post-Tertiary beds of northern Europe: the former is especially characteristic of glacial conditions; and the latter has been noticed by Seguenza as occurring in the older Pliocene at Messina. *T. clathratus* was first noticed and figured by Linné in his ‘Wästgota-Reise’ (1747), from Uddevalla.

I am now convinced that Lovén was right in uniting *T. clathratus* and *T. truncatus*, although the latter is a very distinct variety. The difference consists in the comparative number of ribs, thickness, convexity of the whorls, and the size. My largest specimen of the typical form measures an inch and a quarter in length.

The synonyms are inconveniently numerous, viz. *Murex bamffius*, Donovan; *M. peruvianus*, J. Sowerby; *M. multicostratus*, Escholtz; *Fusus lamellosus*, Gray; *F. scalariformis*, Gould; *Tritonium Gunneri* (a variety), Lovén; and *Murex lamellatus*, Philippi. Mörch cites also *Tritonium Rossii*, Leach; but I cannot verify the reference.

Trophon Fabricii, Beck.

Trophon Fabricii (Beck), Möller, Ind. Moll. Grœnl. p. 14.

Godhavn, 80 fms.; Station 1, 175 fms.; 5, 57 fms.; 12, *Ann. & Mag. N. Hist.* Ser. 4. Vol. xix. 23

1450 fms. (a fragment); Holsteinborg, 35 fms. Greenland (Fabricius and others). Wellington Channel (Belcher)! Gulf of St. Lawrence (Whiteaves). Spitzbergen (Torell)! Iceland (Mörch). Norway (Koren, Friele). Fossil: Wexford (Sir Henry James); Lancashire "drift" (Darbishire); possibly also from the "Middle Glacial" formation, as *T. medigialis* of S. V. Wood.

It is the *Tritonium craticulatum* of Fabricius, but not *Murex craticulatus* of Linné, which is another species of *Trophon*. Our *T. barvicensis* is allied to the present species, as well as to *T. muricatus*.

*Fusus attenuatus**, Jeffr.

Fusus attenuatus, Proc. Roy. Soc. vol. xviii. no. 121 (1870), p. 434.

SHELL spindle-shaped, solid, opaque, rather glossy; the periphery is bluntly angulated in a half-grown specimen: *sculpture* consisting of numerous spiral impressed lines, and of minute close-set and slight lines of growth: *colour* ivory-white: *epidermis* thin and smooth, pale yellowish-white: *spire* long and slender, tapering to a very blunt and regularly spiral point, which is not mamillar or twisted: *whorls* 8-9, compressed, especially below the suture; the last occupies about two thirds of the shell, when viewed with the mouth upwards; the topmost whorls are nearly equal in breadth: *suture* distinct, but not channelled nor deep; it is defined by a thickened edge: *mouth* oblong, acute-angled above; its length, including that of the canal, is about two fifths of the shell: *canal* open, rather long and straight: *outer lip* thin, smooth inside: *inner lip* filmy: *pillar* flexuous: *operculum* ear-shaped, yellowish-brown, curved on the outer side, and incurved towards the base on the inner side; it is marked with a few slight impressed lines, which radiate upwards from the terminal nucleus. L. 2.25. B. 0.85.

Station 13, 690 fms. (a dead specimen). 'Porcupine' Expedition, 1869, off the west of Ireland, 1180-1215 fms. (young specimens and a fragment); Bay of Biscay, 1207 fms. (one living and one dead specimen).

My description is chiefly taken from the living 'Porcupine' specimen.

Differs from *F. propinquus* and its variety *turrita* in being much larger, having a slighter sculpture, a smoother and thinner epidermis, a more tapering spire, compressed whorls, a straighter and more open canal, and a more cylindrical and blunt apex.

* Diminishing, as regards the spire.

Fusus berniciensis, King.

Fusus berniciensis, King in Ann. & Mag. Nat. Hist. xviii. p. 246 (1846).

Var. *elegans*, Station 13, 690 fms. This variety was dredged in the 'Porcupine' Expedition, 1869, off the north of Scotland, in 155-632 fms., and previously by me in Shetland, in 78-100 fms. Another extreme variety (which has a shorter spire and swollen whorls, and is a thin and delicate shell) was dredged in the same expedition, in 203-290 fms.; and it was procured in the late Norwegian Expedition. The latter variety may be called *inflata*. The typical form was dredged in the 'Porcupine' Expedition of 1869 and 1870, Bay of Biscay, at depths of from 90 to 690 fms. 'Lightning' Expedition, 189 and 500 fms. Yorkshire, Northumberland, Aberdeenshire, Shetland, Norway, and Arcachon, 50-140 fms.

It is the *Tritonium islandicum* of Lovén, not *Fusus islandicus* of Chemnitz.

Fusus Sabini, Gray.

Buccinum Sabini, Gray in Suppl. to App. of Parry's first Voyage p. cxl (1824).

BODY milk-white: *tentacles* awl-shaped and slender: *eyes* placed on bulbs at the outer base of the tentacles: *foot* broad and thick, semicircular and double-edged in front, with short angular corners, rounded behind. Active, and crawls out of the water.

Station 6, 410 fms.; a young living specimen (this was erroneously named *F. fenestratus* in my Report to the Royal Society, Proc. vol. xxv. no 173, pp. 183 and 189): also St. 1, 175 fms. (fragments); 12, 1450 fms. (fragments). Davis Strait (Hancock and others). Melville Bay, 100 fms. (Walker). Gulf of St. Lawrence (Whiteaves)! Baffin Bay and Behring Strait (Gray)! North Pacific (Wosnessenski). Spitzbergen (Torell)! Iceland (Mörch, as *F. tortuosus*). White Sea and coasts of Russian Lapland (Baer, Middendorff). Vadsö, Finmark (G. O. Sars, Verkrüzen). Fossil: Bridlington (Leck-enby)!

Synonyms: *F. tortuosus* and *F. spitzbergensis*, Reeve; *F. ebur*, *F. togatus*, and *F. Pfaffii*, Mörch. The epidermis is usually smooth; but in one of my Spitzbergen specimens it is finely and closely ciliated. The same difference is observable in the epidermis of *F. propinquus*, *F. pygmaeus*, and *Buccinum grælandicum*. The comparative length and curvature of the canal are variable characters.

Pleurotomidæ.

Pleurotoma pyramidalis, Ström.

Buccinum pyramidale, Ström, in Nov. Act. Dan. iii. p. 296, f. 22.

BODY pale yellowish-white, with a faint tinge of purple in front: *tentacles* rather short but slender, contractile: *eyes* small, placed on angular projections on the tips of stalks, which are thicker than the tentacles and are united with them for about three fourths of their length: *foot* long, double-edged and squarish in front, with angular corners; bluntly pointed, and occasionally cloven, behind: *siphon* short. Active.

Godhavn, 5–20 fms.; Waigat Strait, 15–25 fms.; Station 4, 20 fms.; 5, 57 fms.; Holsteinborg, 10–12 fms.; St. 7, 1100 fms. (fragment). 'Lightning' Expedition, north of the Hebrides, 189 fms. West Greenland (Möller). East Greenland, 4–30 fms. (Möbius). Spitzbergen, Iceland, Faroe Isles, Novaya Zemlya, and Norway. Labrador to Cape Cod, 4–107 fms. Fossil: Norwich Crag (S. P. Woodward), and all our post-Tertiary deposits, as well as those of Scandinavia and Canada.

The longitudinal ribs on the shell are sometimes more or less wanting; and the colour varies from chocolate to milk-white. Spawn-capsules hemispherical and membranous.

Fusus rufus of Gould, not *Murex rufus* (*Pleurotoma*) of Montagu; *F. pleurotomarius* of Couthouy; and *Defrancia VahlII* of Beck, according to Möller.

Pleurotoma bicarinata, Couthouy.

Pleurotoma bicarinata, Couth. in Boston Journ. Nat. Hist. vol. ii. p. 104, pl. i. f. 11 (1839).

BODY white, with a faint tinge of yellow: *head* small: *mouth* bulbous, cloven lengthwise: *tentacles* rather short but slender, club-shaped at their tips or points: *eyes* small, black, placed on thick stalks, which are united with the tentacles for three fourths of their length at their outer base: *foot* thick and broad, double-edged and gently curved in front, with slight angular corners; bluntly pointed, squarish, or else more or less indented behind: *siphon* cylindrical, of moderate length, slit throughout, with a wide and folded-back opening. Active and not shy.

Godhavn, 5–25 fms.; Waigat Strait, 15–25 fms.; Station 4, 20 fms.; 5, 57 fms. (var. *pallida*); Holsteinborg, 10–12 fms. Greenland (Möller and others)! Wellington Channel (Belcher)! Gulf of St. Lawrence (Whiteaves). North-Atlantic

coasts of United States, from low-water mark to 50 fms. (Mighels and others)! Spitzbergen (Torell)! Iceland (Mörch, Verkrüzen)! Norway, 5–250 fms. (G. O. Sars and others)! ‘Lightning’ Expedition, 170 fms. ‘Porcupine’ Expedition, 1869, off the west of Ireland, 420 fms.; north of the Hebrides, 203–345 fms.

There are at least four varieties, viz. *violacea* of Mighels and Adams (not of Hinds), and *cylindracea*, *Beckii*, and *livida* of Möller (ex typ.), all published in 1842. *P. Beckii* of Reeve, in Cuming’s collection, is a very different and tropical species. Specimens from 57 fathoms are of a pale colour, and those from deeper water are white. Allied to the variety *livida* is *P. gigas* of Beck, which is *Bela levigata* of Dall, and probably *P. schantaricum* of Middendorff. Reeve renamed the present species *P. grænlandica* and *P. rugulatus*: he supposed that it was the *Defrancia suturalis* and *D. rugulata* of Möller; but the latter gave no such names to any of his species. Apparently not *P. bicarinata* of S. V. Wood.

Pleurotoma rubescens, Jeffr.

Holsteinborg, 10 fms. (a single but living specimen).
Described in Proc. Roy. Soc. vol. xxv. p. 183.

Pleurotoma decussata, Couthouy.

Pleurotoma decussata, Couth. in Boston Journ. Nat. Hist. ii. p. 183,
pl. iv. f. 8 (1839).

Godhavn, 5–20 fms.; Waigat Strait, 15–25 fms.; Station 3, 100 fms.; 5, 57 fms. Greenland (Möller, Mörch)! N.E. America, from the Gulf of St. Lawrence to Cape Cod, 10–64 fms. ‘Porcupine’ Expedition, between the north of Scotland and the Faroes, 560 fms.

I have now been able to ascertain that this species is the same as *Defrancia viridula* of Möller (1842); and I was therefore wrong in supposing that the latter was not American (see Proc. Roy. Soc. vol. xxv. p. 189). It is the *P. scalaris* and *P. leucostoma* of Reeve, who imagined that Vahl had described them under the names of *Defrancia scalaris* and *D. reticulata*; but Vahl did nothing of the kind. I would not have noticed Reeve’s numerous mistakes if Mörch had not recognized his so-called species.

Pleurotoma tenuicostata, M. Sars.

Pleurotoma tenuicostata, Sars in Vid. Selsk. Forhandlingar for 1868,
p. 259.

Station 12, 1450 fms. ‘Lightning’ Expedition, 500 and

550 fms. 'Porcupine' Expedition, 1869, off the west of Ireland, 420 and 664 fms.; south of the Faroes, 125 fms.: 1870, Bay of Biscay, 305-717 fms. Upper Norway, 40-300 fms. (G. O. Sars, Friele)!

This pretty little species will soon be described and figured (tab. 17. f. 1) by Professor G. O. Sars. Both he and his late father most obligingly sent me specimens for comparison with mine. A variety occurs in which the longitudinal ribs are replaced by spiral ridges, as in the type of *P. bicarinata*.

Not *Raphitoma tenuicosta* of Seguenza.

Pleurotoma Pingelii, Beck.

Defrancia Pingelii, Beck, Möll. Ind. Moll. Grœnl. p. 13 (1842).

BODY pale yellowish-white, with the front of a purplish hue: *tentacles* thread-shaped, rather short: *eyes* on the bulbous tips of thick stalks, which are united with the tentacles on the outside: *foot* long, squarish and double-edged in front, with angular corners; deeply and evenly cloven or forked behind: *siphon* lining the canal, short and broad.

Godhavn, 5-20 fms.; Waigat Strait, 15-25 fms.; Station 5, 57 fms.; Holsteinborg, 10-30 fms. Greenland (Möller and others)! N.E. America, from the Gulf of St. Lawrence (Whiteaves) to Cape Cod (Mighels and others), 4-430 fms. Spitzbergen (Torell)! Iceland (Mörch)! Upper Norway (M'Andrew, Sars)!

Fusus cancellatus of Mighels and Adams, 1842.

Pleurotoma cinerea, Möller.

Defrancia cinerea, Möll. Ind. Moll. Grœnl. p. 13.

Station 5, 57 fms. Greenland (Möller)! Spitzbergen (Torell)! Iceland (Mörch). 'Porcupine' Expedition, 1869, between the north of Scotland and the Faroe Isles, 290 fms.

My largest specimen is $\frac{9}{16}$ of an inch long.

Pleurotoma declivis, Lovén.

Tritonium declive, Lovén, Ind. Moll. Scand. p. 13.

Station 5, 57 fms. Norway, 30-60 fms. (Lovén and others)! 'Lightning' Expedition, 189 fms. 'Porcupine' Expedition, 1869, between Norway and the Faroes, 64-560 fms.: 1870, Channel slope, 567 fms. (fragment).

My largest specimen is $\frac{6}{16}$ of an inch long.

Var. *angustior*. Narrower and smaller. 'Porcupine' Expedition, 1869, 345 fms. West Finmark (G. O. Sars)!

Pleurotoma elegans, Möller.

Defrancia elegans, Möll. Ind. Moll. Grœnl. p. 13.

BODY milk-white. Animal sluggish or shy.

Godhavn, 5–20 fms.; Station 5, 57 fms.; Holsteinborg, 10 fms. Greenland (Möller and others)! Gulf of St. Lawrence (Whiteaves)! Iceland (Torell)! Fossil at Bridlington (Leckenby), as *P. elegantior* of S. V. Wood!

My largest specimen is $\frac{4}{10}$ of an inch long.

Through the kindness of Dr. Mörch and Professor Lovén I have had the advantage of examining and comparing the types of *P. cinerea*, *P. declivis*, and *P. elegans*; and I regret that I cannot adopt the view which Professor G. O. Sars is inclined to favour, that all these may be one species. I have not yet seen any connecting link between them; and they all occurred to me in the same haul of the dredge at Station No. 5, in the 'Valorous' Expedition, off Holsteinborg. Of course, opinions of naturalists must differ as to the lines of demarcation which separate one species from another in any genus, and likewise as regards allied genera. *Pleurotoma* has been divided by some modern conchologists and palæontologists into a great many genera, although, in my opinion, on insufficient grounds. There ought to be at least one distinctive and fixed character, and no transitional or intermediate forms. *P. cinerea* attains the greatest size; the whorls are more convex, the last is larger in proportion to the rest, and they are not angulated below the suture, as in the other two species; the longitudinal ribs are more numerous than in *P. declivis*; there are at least twice as many spiral striæ, and the sculpture is never cancellated, as in *P. declivis*. The smallest species is *P. elegans*; the whorls are abruptly angulated at the tip; the ribs are more numerous, oblique, and prominent than in *P. cinerea*, and the striæ are fine and close-set.

Pleurotoma turricula, Montagu.

Murex turricula, Mont. Test. Brit. (1), p. 262, t. 9. f. 1 (1803).

Godhavn, 5–20 fms.; Waigat Strait, 15–25 fms.; Station 1, 175 fms.; 3, 100 fms.; 5, 57 fms.; Holsteinborg, 10–30 fms. Melville Bay to Cape Cod, and Spitzbergen to Arcachon. North Japan (St. John)! Depths 10–150 fms. Fossil in our Red and Norwich Crag, and in all the post-Tertiary beds of Great Britain, Scandinavia, and Canada.

The sculpture is extremely variable. Having before me a great number of specimens from various parts of the North Atlantic, and after a careful examination and comparison of

the types of several so-called species, both recent and fossil, I am convinced that the following must be considered synonyms of the present species—*Defrancia nobilis*, *scalaris*, and *Woodiana* of Möller, *Tritonium roseum* of M. Sars, *Bela americana* of Packard, and *P. Dowsoni* and *robusta* of S. V. Wood. *P. harpularia* of Couthouy may be distinct; but it is questionable. Donovan published his specific name *angulatus* in the same year as Montagu; and that name might be adopted if Brocchi's name *turricula*, given in 1814 to a fossil and sub-Apennine species of *Pleurotoma*, be not changed. But it seems a pity to disturb the name by which the present species is so well known. *Bela* constitutes only a section or division of *Pleurotoma*; and consequently that will not help us.

Pleurotoma exarata, Möller.

Defrancia exarata, Möller, Ind. Moll. Grœnl. p. 12.

Godhavn, 5–20 fms.; Waigat Strait, 15–25 fms.; Station 1, 175 fms.; 5, 57 fms.; Holsteinborg, 10–30 fms. 'Porcupine' Expedition, 1869, off the west of Ireland, 164–1230 fms. Greenland (Möller and others)! Iceland (Mörch). Norway (Lovén and others)! Eastern coasts of North America (Couthouy, Whiteaves, and others)! Fossil: Red Crag (A. Bell). Labrador (Packard).

Closely allied to some of the varieties of *P. turricula*; but the canal is shorter and the base broader.

Reeve called this species *P. Mölleri*; and he stated that it was the *Defrancia lactea* of Möller, a name which is not to be found in the work of the last-named author.

Pleurotoma Trevelyana, Turton.

Pleurotoma Trevelianum, Turton in Mag. Nat. Hist. vii. p. 351 (1834).

See 'British Conchology,' iv. p. 398, as to the emendation of the specific name.

Var. *Smithii*. Shell smaller; ribs more prominent, but not extending below the upper half of the body-whorl, and sometimes altogether wanting; infrasutural keel stronger; spiral striæ slighter, and consisting of impressed lines; there is no reticulation.

Station 4, 20 fms.; 5, 57 fms.; Holsteinborg, 10–12 fms. Massachusetts Bay (Stimpson)! Gulf of St. Lawrence (Whiteaves)! Newfoundland (Verkrüzen)!

The typical form inhabits the North Atlantic, from Spitzbergen to Yorkshire, and from Port Kennedy to the Gulf of St. Lawrence, at depths of 6–189 fathoms. Dr. Philip Carpenter has recorded it from the west coast of North America. It is one of the usual glacial fossils of Great Britain, Scandinavia,

and Canada. Captain Feilden found it in the recent Arctic Expedition, in a raised sea-bed in Kane Valley, in $82^{\circ} 33'$ north latitude. *P. Trevelyana* has a narrower base, and is therefore more fusiform than *P. exarata*; and the spire is shorter than that of *P. turricula*, which gives the present species a more oval shape. It is the *P. reticulata* of Brown (1827), and *P. decussatum* of Macgillivray. Brown's name has priority of all the others, but may be regarded as obsolete.

Bullidæ.

Cylichna alba, Brown.

Volvaria alba, Brown, Ill. Conch. G. B. & I. pl. xxxviii. f. 43, 44 (1827).

Station 1, 175 fms.; 4, 20 fms.; 6, 410 fms. (living); Holsteinborg, 12 fms. 'Lightning' Expedition, 189 and 530 fms. Swedish Arctic Expedition, 1868, 1400 fms.! 'Porcupine' Expedition, 1869, west coast of Ireland, 420-1366 fms. (living at the last-mentioned depth): 1870, Bay of Biscay, 795-994 fms. 'Challenger' Expedition, off the Azores, 450 and 1000 fms. Norwegian Arctic Expedition, 1876, 1180 fms.! From Cape York to Cape Cod, and from Spitzbergen and Novaya Zemlya to Shetland, at depths of from 7 to 300 fathoms. West coast of North America (*P. Carpenter*). North Japan, 35-48 fms. (St. John)! Fossil in the Norwich Crag, the older Pliocene of Sicily, and the newer Tertiaries of Great Britain, Scandinavia, and N.E. America; Arctic Expedition, 1875-6, Kane Valley, $82^{\circ} 33'$ north latitude (Feilden)!

I mention this common arctic species to show the range of hydrographical distribution and depth. In some specimens the crown is more or less truncated; and in others the minute and close-set spiral striæ are absent.

It is the *Bulla triticea* of Couthouy, *B. corticata* of Möller, and *C. nucleola* of Reeve.

Utriculus obtusus, Montagu.

Bulla obtusa, Mont. Test. Brit. (1), p. 223, t. 7. f. 3 (1803).

Var. *turrata*. *Bulla turrata*, Möll. Ind. Moll. Grœnl. p. 6.

BODY milk-white, semitransparent, covered with microscopic tubercles: head snout-shaped, prominent, being of the same breadth as the foot in front, so as to appear united with it: tentacles triangular and broad, separated by the head-flap: eyes, none perceptible: foot large, wedge-shaped in front and cloven behind.

Godhavn, 5-20 fms.; Station 5, 57 fms.; Holsteinborg, 10 fms.

The distribution of this species and its varieties is very extensive, from Spitzbergen to the Adriatic, and all along the eastern coasts of North America from Wellington Channel to Cape Cod. Its habitat ranges from low-water mark to 114 fathoms, and it especially frequents brackish water. Fossil in the Norwich Crag, and in the newer Tertiaries of Scandinavia, Great Britain, and Germany.

The shell varies remarkably in length and constriction, as well as in the extension or prominence of the spire; but specimens from various localities are found to pass one into another. The arctic, North-American, and Norwegian form (*Bulla pertenuis* of Mighels) is smaller, shorter, broader, and more cylindrical than our estuarine and typical form. The *Bulla turrita* of Möller closely resembles and corresponds with the variety of the present species which I described and figured as *Lajonkaireana*. Writers on British shells formerly gave several other names, which may now be considered obsolete. Brusina described a small variety, having a depressed spire, from Dalmatia, as *Cylichna leptoneilema*.

A small fragment of another species occurred at Station 12, 1450 fathoms. It consists of the anterior portion of a short cylindrical shell, which is of a milk-white colour, glossy, and marked with slight and rather distant spiral striæ or rather impressed lines; the sculpture does not extend to the crown; the apex is semiglobose, and sunk within a sharp obliquely encircling ridge. The species may be called *lacteus*. I also dredged a young specimen of this species in the 'Porcupine' Expedition of 1869, off the west coast of Ireland, at a depth of 1443 fathoms.

Utriculus substriatus *, Jeffr.

SHELL represented by a single specimen, which was unfortunately broken in sifting the dredged material. It resembles *Bulla hyemalis*, Couthouy, = *Amphisphyra globosa*, Lovén, = *Utriculopsis vitrea*, M. Sars, except in being smaller, shorter, and equally broad throughout, instead of barrel-shaped; the crown is consequently longer in proportion, and not so much raised at the point; but the especial difference consists in this being beautifully sculptured, and not smooth like the other species; besides a few coarse spiral ridges the whole surface is closely and microscopically striated in the same direction. L. 0.1. B. 0.075.

Station 9, 1750 fms.

* Somewhat striated.

Utriculus hyalinus, Turton.

Bulla hyalina, Turton, in Mag. Nat. Hist. vii. p. 353 (1834).

Station 5, 57 fms. 'Porcupine' Expedition, 1869, west of Ireland, 183 fms. From Spitzbergen (Torell) to the Egyptian coast of the Mediterranean (Schneider); Madeira and the Canaries (M'Andrew); Davis Strait to Cape Cod. Depths 10-150 fms. One of the glacial fossils of Scotland and Scandinavia.

U. minutus and *U. candidus* of Brown, and possibly also his *U. pellucidus* (1827); but although these names are prior to that given by Turton, not one of them has been adopted by subsequent authors. In the second edition of Brown's work, published in 1844, he describes "*U. hyalina*" of Turton as a different species. It is the *Bulla debilis* of Gould (1840), and *B. subangulata* of Möller (1842).

Actæon exilis, Jeffr.

Actæon exilis, Jeffr. in Ann. & Mag. Nat. Hist. ser. 4, vol. vi. p. 85 (1870).

Station 12, 1450 fms. (fragments). 'Porcupine' Expedition, 1869, west of Ireland, 1215 fms.; 1870, Channel slope and Bay of Biscay, 227-994 fms.; Mediterranean, 92-1456 fms. Ægean, 210 fms. (Spratt)! Off Malta, 300 fms. (Nares)! Palermo, about 100 fms. (Monterosato). Fossil in the older Pliocene of Sicily (Seguenza).

One of the 'Valorous' fragmentary specimens indicates a much larger size than usual. The operculum in 'Porcupine' specimens agrees with my description of that of *A. tornatilis* in the 4th volume of 'British Conchology,' pp. 432-3.

Scaphander puncto-striatus, Mighels and Adams.

Bulla puncto-striata, M. & A. in Proc. Bost. Soc. Nat. Hist. i. p. 49 (Nov. 1841).

BODY yellowish, with an edging of reddish-brown round the hood in front and about the mouth. In all other respects like *S. lignarius*.

Station 12, 1450 fms. (fragments); 13, 690 fms. (living). 'Lightning' Expedition, 189 fms. 'Porcupine' Expedition, 1869, west of Ireland, 420-1380 fms.: 1870, Channel Slope, 539-690 fms.; Bay of Biscay, 740-1095 fms. 'Challenger' Expedition, off the Azores, 1000 fms. Iceland (Torell). Norway (Lovén and others)! Shetland (J. G. J.). North-eastern coasts of United States (Mighels and others). Pa-

lerno (Monterosato). Depths 20-300 fms. Fossil in the older Pliocene of Sicily (Seguenza).

Specimens vary somewhat in shape, some being more oval than others; the punctures differ in size, and the rows in comparative distance. The North-American and 'Challenger' specimens represent a smaller, stouter, and shorter form; and off the coast of Portugal both forms with intermediate gradations were obtained in the 'Porcupine' dredgings.

This species is the *S. librarius* of Lovén, 1846.

NUDIBRANCHIATA.

I obtained very few of this order; and those are widely distributed in northern seas. I subjoin short descriptions of the following three species from my note-book.

Eolididæ.

Eolis salmonacea, Couthouy.

Eolis salmonacea, Couth. in Bost. Journ. Nat. Hist. ii. p. 68, pl. i. f. 2 (1839).

BODY oblong, yellowish-white: *head* prominent and broad, rounded in front, with small side-lappets or processes: *mouth* vertical, continually opening and shutting: *tentacles* 4; upper pair longer than the lower ones, serrated or notched at their edges, and retractile; lower pair contractile, widely separated from the upper pair: *eyes* very small, sunken and subcutaneous, placed in front of the upper pair of tentacles: *mantle* protecting the whole body, and covered with numerous and close-set club-shaped papillæ or tubercles, which are arranged down the sides; these are irregular in size, but become shorter and smaller at the edges of the mantle and at the end of the body; each papilla has a brown stripe (as a nucleus) down its centre; they are retractile, like the upper pair of tentacles; the extremities or tips appear to be open: *foot* long, rounded and double-edged in front, contracted and pinched up behind at the vent or tail. Active and hardy; floats in a reversed position or on its back.

Station 4, 20 fms. (a young individual). It is of course North-American; but its range is doubtful.

The synonymy is very confused. It appears to be the *Doris papillosa* of Fabricius, but not of Linné, *Æolis papilligera* of Beck, and *Æolidia bodocensis* of Möller, not *Doris bodoënsis* of Gunnerus.

Dorididæ.

Doris repanda, Alder and Hancock.

Doris repanda, A. & H. in Ann. & Mag. Nat. Hist. ser. 1, ix. p. 32 (1842).

BODY oblong, lemon-coloured: *mantle* thickly covered with small round tubercles of different sizes: *dorsal tentacles* retractile, short, elegantly convoluted or fluted in an obliquely spiral direction, one on each side near the front; they are of a light brown colour: *eyes* not discoverable: *foot* oblong: *vent* or anal opening small, fringed. Floats on its back. Spawn deposited on the stalks and fronds of *Fucus nodosus*.

Godhavn, 5 fms. From Spitzbergen (Krøyer, *vide* Mörch) to Calvados in the North of France (Fischer).

According to Lovén this is the *D. obvelata* of O. F. Müller.

Doris bilamellata, Linné.

Doris bilamellata, Linn. Syst. Nat. ed. 12, p. 1083 (1767).

BODY yellowish-white: *mantle* thick, streaked or blotched with brown, and covered with numerous tubercles of different sizes: *head* of the same breadth as the foot, and semicircular: *tentacles* retractile, pale orange, laminated in two unequal divisions: *eyes*, none observable: *foot* large, rounded in front, and bluntly pointed or angulated behind: *vent* encircled by numerous tentacular processes which vary in size and length and are retractile. Floats in a supine position. Spawn semiconvoluted.

Station 4, 20 fms.; Waigat Strait, at low water. Greenland and Iceland to the north-west of France, and on the eastern coasts of the United States.

For the synonymy see the late Mr. Alder's remarks in 'British Conchology,' vol. v. p. 90; to which may be added, on Mörch's authority, *D. muricata* of M. Sars, not of Müller.

PTEROPODA.

Shells of these oceanic "butterflies" were found everywhere during the expedition in deep water; and a few species were taken alive in the tow-net. Among the former I may mention *Limacina reticulata*, D'Orbigny (*Spirialis clathrata*, Souleyet, = *Peraclis physoides*, Forbes, = *S. recurvirostra*, A. Costa), *L. balea*, Möller, *L. retroversa*, Fleming, and *L. bulimoides*, Souleyet, besides well-known species of *Cavolina* (*Hyalæa*) and *Clio* (*Cleodora*). The only Pteropod which I consider new to science will be now described; and

although all the specimens consisted of fragments only, the species is very distinct and peculiar.

*Limacina helicoides**, Jeffr.

SHELL like a reversed *Helix nemoralis*, extremely thin, opaque, brittle, and glossy: *sculpture*, a few delicate spiral striae, and close-set microscopic lines of growth: *colour* brownish-yellow: *spire* depressed, not flat: *whorls* 4, rather convex: *suture* slight but distinct: *mouth* irregularly and narrowly oval, rounded on the outside, acute-angled above, and pointed below: *pillar* twisted, furnished at its base a little way inside with a sharp and curved ridge, which corresponds with a keel on the outside: *umbilicus* none. L. 0.5. B. 0.4.

Station 12, 1450 fms. 'Porcupine' Expedition, 1869, west of Ireland, 1215 fms.: 1870, Bay of Biscay, 740-1095 fms.

Clionidæ.

Clione borealis, Pallas.

Clione borealis, Pallas, Spic. Zool. x. p. 28, t. i. f. 18, 19 (1774).

BODY long and slender, pinkish or reddish-brown about the front and tail; liver brown; the middle portion and the rest of the body are gelatinous and veined lengthwise; the whole surface is irregularly covered with microscopic tubercles: *head* transversely oval, separated from the middle of the body by a short and thick neck; it is furnished with 6 bulbous processes (3 on each side), which are of a bright pink colour; these are plain and not armed with suckers or cups, and they do not project beyond the head: *mouth* semiglobular, the lips being placed lengthwise: *tentacles* 2, projecting like horns on each side of the head at the top; they are conical and finely pointed, retractile within sheaths, as in *Doris*, not armed with any suckers: *eyes* none: *fins* or foot-lobes 2, broad, leaf-shaped, membranous, and delicately reticulated; below the fins are two appendages, which may serve as a second or lower pair of tentacles; these appendages are triangular, and folded close to the body, where they assume the shape of a human heart: *tail* pinched up, and ending in a fine point; it is speckled with minute black dots. Very active and hardy, unceasingly flapping its fins and wriggling its tail, by means of which it swims rapidly. My account does not agree with any of the descriptions and figures of this remarkable mollusk as given

* Resembling a *Helix*.

by modern writers; I except Fabricius's description, which is admirable.

Disco harbour and Waigat Strait. Only two or three specimens could be found.

Clione borealis has a wide range as regards longitude, from Novaya Zemlya to the eastern coasts of North America. It is said to abound in arctic seas during the summer and autumn, and to be the principal food of the right whale.

It is the *Clione papilionacea* of Pallas, *Clio limacina* of Phipps, *Clio retusa* of Müller and Fabricius (not of Linné), and *Clio Miquelonensis* of Rang. The date of publication by Pallas and Phipps is the same. *Clione borealis* was first noticed and figured by Martens in his voyage to Spitzbergen and Greenland, under the name of the "Sea May Fly."

Since the publication in the 'Annals' of my former papers on this subject I have had some additional information, and become aware of a few slight omissions, which enable me to add a short supplement.

Montacuta Dawsoni. Newfoundland (Verkrüzen).

Kellia symmetros. A single valve, much larger than the specimen which I have described, was procured by Mr. Friele in the recent Norwegian Expedition at a depth of 488 fathoms.

Cadulus tumidosus. A small variety was dredged in West Norway by Professor G. O. Sars, who considers it a distinct species, and proposes to name it *propinquus*.

Trochus umbilicalis. Cape York, 10 fms., and Port Kennedy (Walker).

Rissoa castanea. White Sea (Middendorff).

Turritella erosa. Syn. *T. polaris* (Beck), Möller.

Turritella reticulata. Melville Bay, 80-100 fms. (Walker).

Odostomia albula. Gulf of St. Lawrence, 20 fms. (Whit-eaves).

I have now fulfilled my pledge to the Royal Society with respect to the Mollusca of the 'Valorous' Expedition.

XXXIII.—*Notes on New-Zealand Ichthyology*.

By JAMES HECTOR, F.R.S., C.M.Z.S.

Brama squamosa.

C.M.

Toxotes squamosus, Hutton, Trans. New-Zealand Inst. viii. p. 210.

D. 3-35. V. 2-29.

The type of the above was presented to the Colonial Museum